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EXAMINER

BODDIE, WILLIAM

ART UNIT

PAPER NUMBER

2674

DATE MAILED: 09/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,037

Applicant(s)

LEE ET AL.

Examiner

William Boddie

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>JP9-90916 Translation</u> |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. (US 5,117,224) in view of Ito (JP 9,090,916).

With respect to claim 1, Kawamura discloses, a liquid crystal display (LCD), comprising: an LCD panel having an upper electrode layer (4 in fig. 2) and a lower electrode layer (5a, 5b, 5c in fig. 2) and a plurality of color filters including a red color filter, a green color filter and a blue color filter (FR, FG, FB in fig. 2), to selectively filter white light; a driver for driving the upper and lower electrode layers of the LCD panel to interpose non-display periods (col. 6, lines 9-12, and T2 in fig. 8a) between display periods for displaying a desired color by mixing a combination of red light, green light and blue light

Kawamura does not expressly disclose, wherein during non-display periods, the driver drives the upper and lower electrode layers to display white light, which includes all of the red, green, and blue light.

Ito discloses, inserting a white sub-field in the display of data (W in fig. 3a). As is well-known white light is comprised of red, green and blue light, therefore Ito's display of white light, includes all of the red, blue, and green light.

Ito and Kawamura are analogous art because they are from the same field of endeavor namely, LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the white display period of Ito in the non-display period of Kawamura.

The motivation for doing so would have been to reduce color separation and to reduce a color change (Ito, Problem to be Solved).

Therefore it would have been obvious to combine Ito and Kawamura for the benefit of reducing color separation to obtain the invention as specified in claim 1.

With respect to claim 8, as claim 8 is merely a method statement of the above limitations of claim 1, claim 8 is rejected on the same merits as shown above.

3. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. (US 5,117,224) in view of Ito (JP 9,090,916) and further in view of Yoshinaga et al. (US 2001/0038371).

With respect to claim 2, Kawamura and Ito disclose, the LCD according to claim 1 (see above), and wherein during non-display periods, the driver drives the upper and lower electrode layers to display white light (W in fig. 3a), which includes all of the red, green, and blue light.

Kawamura and Ito do not expressly disclose, wherein during non-display periods, the driver drives the upper and lower electrode layers to display none of the red, green, and blue light at a different, distinct time period.

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Yoshinaga discloses, inserting a black display period into a frame (reset period in fig. 7, and paragraph 63). As is well known black display is composed of none of the red, green, and blue light, therefore, Yoshinaga's display of black does not include any red, green, or blue light.

Ito, Kawamura, Yoshinaga are all analogous art because they are from the same field of endeavor namely, LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to also include a black display period, taught by Yoshinaga, in addition to the white display period, taught by Ito, in the non-display period of Kawamura.

The motivation for doing so would have been to reset the pixel, and allow for faster adjustment amongst transmission levels within the pixel.

Therefore it would have been obvious to combine Ito, Kawamura, and Yoshinaga for the benefit of resetting the pixel to obtain the invention as specified in claim 2.

With respect to claim 9, as claim 9 is merely a method statement of the above limitations of claim 2, claim 9 is rejected on the same merits as shown above.

4. Claims 3-5, 7, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. (US 5,117,224) in view of Ito (JP 9,090,916) and further in view of Iwauchi (US 5,843,492).

With respect to claim 3, Kawamura and Ito disclose, the LCD according to claim 1 (see above).

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Kawamura and Ito do not expressly disclose, wherein the plurality of color filters are transmissive color filters attached to an upper portion of the LCD panel.

Iwauchi discloses, a plurality of transmissive color filters (6 in fig. 1) attached to an upper portion of the LCD panel (8 in fig. 1, also note col. 13, lines 63-67 and col. 14, lines 1-12).

Ito, Kawamura, Iwauchi are all analogous art because they are from the same field of endeavor namely, LCD panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace Kawamura's lower portion color filters with Iwauchi's upper portion transmissive color filters.

The motivation for doing so would have been to eliminate the need for contact through-holes.

Therefore it would have been obvious to combine Ito, Kawamura, and Iwauchi for the benefit of eliminating contact through-holes, to obtain the invention as specified in claim 3.

With respect to claim 4, Kawamura, Ito and Iwauchi disclose, the LCD according to claim 3 (see above).

Iwauchi further discloses, a reflecting plate (16 in fig. 2a, col. 7, lines 15-17).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include a reflecting plate, taught by Iwauchi, in the LCD panel disclosed by Kawamura and Ito.

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The motivation for doing so would have been to lower power consumption by requiring a backlight to illuminate the panel.

Therefore it would have been obvious to combine Ito, Kawamura, and Iwauchi for the benefit of lower power usage to obtain the invention as specified in claim 4.

With respect to claim 5, Kawamura and Ito disclose, the LCD according to claim 1 (see above), wherein the color filters are attached to the lower portion of the LCD panel.

Kawamura and Ito do not expressly disclose, wherein the plurality of color filters are reflective color filters.

Iwauchi discloses, reflective color filters (21(a,b,c) in fig. 6, col. 14, lines 25-28)

At the time of the invention it would have been obvious to one of ordinary skill in the art to include reflective color filters, disclosed by Iwauchi, in the LCD panel of Kawamura and Ito.

The motivation for doing so would have been to remove the need for a reflecting plate in panel.

Therefore it would have been obvious to combine Ito, Kawamura, and Iwauchi for the benefit of eliminating the need for a reflecting plate to obtain the invention as specified in claim 5.

With respect to claim 7, Kawamura, Ito and Iwauchi disclose, the LCD according to claim 5 (see above).

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Iwauchi further discloses, wherein the red color filter, the green color filter, and the blue color filter of the reflective color filter are made of dielectrics having different indices of refraction (While Iwauchi's embodiments use cyan, magenta, and yellow there is no reason one couldn't create the same filter using red, green, and blue. Col. 14, lines 36-45).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to construct the red, green, and blue filters of Kawamura with dielectrics of different indices of refraction, taught by Iwauchi.

The motivation for doing so would have been to create filters of similar heights, unlike Kawamura.

Therefore it would have been obvious to combine Ito, Kawamura, and Iwauchi for the benefit of similar size color filters to obtain the invention as specified in claim 7.

With respect to claim 10, as claim 10 is merely a method statement of the above limitations of claim 3, claim 10 is rejected on the same merits as shown above.

With respect to claim 11, as claim 11 is merely a method statement of the above limitations of claim 5, claim 11 is rejected on the same merits as shown above.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. (US 5,117,224) in view of Ito (JP 9,090,916) in view of Iwauchi (US 5,841,492) and further in view of Alvarez (US 5,131,736).

With respect to claim 6, Kawamura, Ito, and Iwauchi disclose, the LCD according to claim 5 (see above).

They do not expressly disclose wherein the red, blue, and green reflective filters are made of photonic crystals, which are alternate arrays of dielectrics.

Alvarez discloses, a filter constructed of alternate arrays of dielectrics (col. 3, lines 27-45).

Kawamura, Ito, Iwauchi, and Alvarez are all analogous art because they are directed to a similar problem solving area, namely filtering white light efficiently.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the dielectric array of Alvarez in place of the dielectric mirror of Iwauchi.

The motivation for doing so would have been for the higher efficiency of the dielectric array (Alvarez, col. 1, lines 21-25).

Therefore it would have been obvious to combine Kawamura, Ito, Iwauchi, and Alvarez for the benefit of better filter efficiency to obtain the invention as specified in claim 6.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sato et al. (US 2002/0196220) discloses a non-display period and the insertion of a white display period. Kurata (US 6,552,765) discloses a reflection LCD of varying types.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Will Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 8:00 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wlb
9-21-05


REGINA LIANG
PRIMARY EXAMINER